

In the Claims:

1. (Currently Amended) A semiconductor device comprising:
a functional device that is responsive to test stimuli; and
an integral characterization unit to control the functional device, in response to test interface inputs generated externally from the semiconductor device, to operate in response to the test stimuli for providing characterization data for the functional device, the integral characterization including
a variable voltage controller that is responsive to the test interface inputs
by providing a variable voltage to the functional device, and
a variable clock signal controller that is responsive to the test interface
inputs by providing a variable clock signal to the functional device.
2. (Currently Amended) A semiconductor device as claimed in claim 1, wherein the integral characterization unit provides a control signal to control an operating parameter of the functional device to generate pass/fail data in response to the test stimuli that are provided directly to the functional device, via circuit connectors, from an external test stimuli generator.
3. (Previously Presented) A semiconductor device as claimed in claim 2, wherein the integral characterization unit provides a control signal to control a voltage supply of the functional device.
4. (Previously Presented) A semiconductor device as claimed in claim 2, wherein the integral characterization unit provides a control signal to control a clock signal of the functional device.
5. (Previously Presented) A semiconductor device as claimed in claim 1, wherein the functional device receives the test stimuli directly from an external source.
6. (Previously Presented) A semiconductor device as claimed in claim 5, wherein the functional device is responsive to said test data by producing a test response.

7. (Previously Presented) A semiconductor device as claimed in claim 5, wherein the functional device receives a control signal from said integral characterization unit.
8. (Previously Presented) A semiconductor device as claimed in claim 4, wherein the integral characterization unit provides the clock signal externally to said functional device.
9. (Previously Presented) A semiconductor device as claimed in claim 1, comprising a test interface, and wherein the integral characterization unit receives data through the test interface.
10. (Previously Presented) A semiconductor device as claimed in claim 1, further including software control means to provide control data to the integral characterization unit.
11. (Previously Presented) A semiconductor device as claimed in claim 1, further including hardware control means to provide control data to the integral characterization unit.
12. (Previously Presented) A semiconductor device claimed in claim 10, wherein the control means provides control data to the integral characterization unit through a test interface of the semiconductor device.
13. (Previously Presented) A semiconductor device as claimed in claim 5, further including built in test hardware to provide test data to the functional device in response to control inputs from the integral characterization unit.
14. (Previously Presented) A semiconductor device as claimed in claim 13, wherein the built in test hardware is IEEE 1149.1 compliant.

15. (Previously Presented) A semiconductor device as claimed in claim 13, comprising a test interface and wherein the built in test hardware receives test data through a test interface of the semiconductor device.

16. (Previously Presented) A semiconductor device as claimed in claim 13, wherein the built in test hardware is responsive to said test data supplied to said functional device by providing test response data.

17. (Previously Presented) A semiconductor device as claimed in claim 16, wherein the built in test hardware outputs said test response data from the functional device.

18. (Previously Presented) A semiconductor device as claimed in claim 1, further including a memory module to store characterization data of the functional device.

19. (Previously Presented) A semiconductor device as claimed in claim 1, further including a controller to provide control data to the integral characterization unit.

20. (Currently Amended) A semiconductor device comprising
a functional device,
~~an integral characterization unit, including a variable voltage controller and a variable clock signal controller, for providing characterization test data to the functional device,~~
built-in test hardware providing functional test data to the functional device,
an integral characterization unit, including a variable voltage controller and a variable clock signal controller, for providing characterization test data to the functional device and for providing a variable voltage signal and a clock signal to the built-in test hardware, and
a controller that controls the integral characterization unit and the built-in test hardware.

21. (Previously Presented) A semiconductor device as claimed in claim 1, further including,
a memory module that stores characterization data of the semiconductor device,
a controller that provides control data to the integral characterization unit, wherein

the controller communicates with the memory module.

22. (Previously Presented) A semiconductor device as claimed in claim 19, wherein the controller receives data over a test interface of the semiconductor device.

23. (Currently Amended) A method of characterizing a semiconductor device including a functional device that is responsive to test stimuli, the method comprising
providing an integral characterization unit in the semiconductor device, and
using the integral characterization unit to control, in response to test interface inputs generated externally from the semiconductor device, the functional device, ~~in response to test interface inputs generated externally from the semiconductor device~~, to operate in response to the test stimuli by providing a variable voltage and a variable clock signal to the functional device to operate the functional device, and by outputting characterization data including pass/fail data for the functional device.

24. (Previously Presented) A method as claimed in claim 23, further comprising providing a control signal to control an operating parameter of the functional device.

25. Cancelled

26. (Previously Presented) The device of claim 1, wherein the integral characterization unit consists of

a variable voltage controller that is responsive to the test interface inputs by providing a variable voltage to the functional device, and
a variable clock signal controller that is responsive to the test interface inputs by providing a variable clock signal to the functional device.

27. (Previously Presented) The device of claim 1, wherein the integral characterization unit controls the functional device, in response to test interface inputs generated externally from the semiconductor device, to provide characterization data including pass/fail data selected from the group of: minimum and maximum operating voltage,

minimum and maximum operating temperature, and minimum and maximum operating clock frequencies.

28. (Cancelled)

29. (Previously Presented) The method of claim 23, wherein using the integral characterization unit to control the functional device consists of
 providing a variable voltage to the functional device, and
 providing a variable clock signal to the functional device.